

Study program: Mechanical engineering			
Type and level of studies: Master studies			
Course unit: Factory Plants			
Teacher in charge: Prof. Dr Mile Savković			
Language of instruction: English			
ECTS: 6			
Prerequisites: None			
Semester: Autumn			
Course unit objective: Systematic obtaining a general knowledge in the field of design construction and operation of manufacturing plants, as well as problems of material movement, layout and operation of the equipment. Also, define the general guidelines for the design of manufacturing plants and compliance with applicable regulations and standards.			
Learning outcomes of the Course unit Introducing the principles of training and knowledge to work as an engineer in the design, construction and operation of manufacturing plants, material movement, layout and operation of equipment as well as connection with industrial complex and the environment.			
Course unit contents <i>Theoretical classes</i> The goal of the design. Design factory. Technical and other requirements for the design. Previous analyzes. The Terms of Reference. The scope, method of preparation and content of the project study. The choice of location for setting up the factory. Types of factory buildings. Program production. The volume of production. Design layout and technical capacity. Subsystems factory. The division and classification workshop. Movement of materials. The movement of people. The interdependence of internal transport and deployment of equipment. The main types of internal transport system. Determining the capacity of the system. Criteria for the selection of the transport system. Methods for analyzing the movement of materials. Data collection for the analysis of material movement. Queuing theory. Basic models of the queuing theory. The main types of production. Interaction of the production process and internal transport. Determining the degree of automation. The design procedure. Determine the number and capacity of production and other equipment and the required number of jobs and workers. Calculation of the required surface. The basic principles of layout of machines, jobs and land. Making of workshops and the whole factory plan. Setting up equipment, admission and dispatch ramps, utility area. <i>Practical classes</i> Introducing the derived solutions of manufacturing plants.			
Literature James A. Tompkins, John A. White, Yavuz A. Bozer, J. M .A. Tanchoco, Facilities Planning, John Wiley & Sons, 2010. Chandrashekar Hiregoudar, Facility Planning And Layout Design, Technical Publications, 2007.			
Number of active teaching hours			Other classes
Lectures: 2	Practice: 1	Other forms of classes: 2	Independent work:
Teaching methods Theoretical classes in the form of lectures carried out in the classroom. The exercises are performed in the classroom and computer laboratory in the field of design construction and operation of manufacturing plants, as well as problems of material movement, layout and operation of the equipment. Project objectives are realized through work on exercises.			
Examination methods (maximum 100 points)			
Exam prerequisites	No. of points:	Final exam	No. of points:
Student's activity during lectures	5	oral examination	
practical classes/tests	5	written examination	30
Seminars/homework	30	
Project	30		
Other			
Grading system			
Grade	No. of points	Description	
10	91-100	Excellent	
9	81-90	Exceptionally good	
8	71-80	Very good	
7	61-70	Good	
6	51-60	Passing	
5	Less than 50	Failing	